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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael J. Ram
KOPPEL & JACOBS
Suite 107
555 St. Charles Drive
Thousand Oaks, CA 91360

EXAMINER
KEEHAN, CHRISTOPHER M

ART UNIT	PAPER NUMBER
1712	

DATE MAILED: 07/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/855,921	Applicant(s) GU ET AL.	
	Examiner Christopher M. Keehan	Art Unit 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 53-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,53-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/27/03 has been entered.

Claim Rejections - 35 USC § 103

Claim 1-6, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiota et al. (5,773,178). Regarding claims 1, 53, and 54, Shiota et al. disclose an isotropic (col.5, line 62-col.6, line 9) alignment layer for a liquid crystal device comprising a cured transparent and non-birefringent polymer film formed from an epoxy and a reactive mesogen that can be in a mixture (col.3, lines 30-53), the cured transparent and non-birefringent polymer film comprising polymerized liquid crystals randomly oriented, said polymerized liquid crystals at an exposed surface of the transparent and non-birefringent polymer film capable of being subsequently aligned, more specifically azimuthally oriented. Although Shiota et al. do not specifically disclose

an example with a mixture of the epoxy and the mesogen, Shiota et al. do disclose two major groups of photopolymerizable liquid crystal monomers, diacrylate and diepoxides (col.3, lines 30-53), and a mixture of one or more photopolymerizable liquid crystal monomers (col.3, lines 54-56). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a mixture of the epoxy and the diacrylate liquid crystal monomers as instantly from the composition of Shiota et al. because Shiota et al. teach a mixture of one or more photopolymerizable liquid crystal monomers and two major types thereof, epoxy and diacrylate, to be chosen for the mixture.

Regarding claim 2, Shiota et al. do not teach or disclose the necessary inclusion of polyimides (entire document).

Regarding claim 3, Shiota et al. teach wherein the epoxy is UV curable (col.4, lines 48-67).

Regarding claim 4, Shiota et al. disclose a photo-initiator mixed with the epoxy (col.3, lines 54-57).

Regarding claim 5, Shiota et al. disclose methylhydroquinone and hydroquinone used in the composition (Example 1), which are known thermal inhibitors.

Regarding claim 6, Shiota et al. do not appear to disclose wherein the epoxy comprises between 10% and 80% by weight of the alignment layer. However, Shiota et al. do disclose that the polymerizable monomers can be present in from at least 25 mol% based on 100 mol% of polymerizable monomers (col.2, lines 23-28), thereby identifying these as result-effective variables. It would have been obvious to one of

ordinary skill in the art at the time the invention was made, as the claimed range of between 10% and 80% by weight of epoxy is so broad, and Applicant has shown no criticality as to an amount outside of this broad range, to have added the epoxy in a variety of amounts, including that as instantly claimed, through routine experimentation and optimization. It has been held that where the general conditions are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller, 105 USPQ 233, 235.* A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Boesch, 205 USPQ 215.*

Regarding claim 54, Shiota et al. disclose a reactive mesogen of UV curable diacrylate monomer (col.3, lines 17-43).

Claim 1-4, 6, and 53-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akashi et al. (5,891,357). Regarding claims 1 6, and 53, Akashi et al. disclose a layer comprising a cured transparent and non-birefringent polymer film (col.14, lines 5-15) that can be formed from an epoxy as a crosslinker (col.6, lines 35-43) and an epoxy as a binder (col.8, lines 38-50) and a reactive mesogen (col.4, line 25-col.5, line 67) in mixture (col.6, lines 44-49), the polymerized liquid crystals at an exposed surface of the transparent and non-birefringent polymer film capable of being subsequently aligned. It is the examiner's position that, because the materials of Akashi et al. are the same as those claimed by applicant, the same properties would have also

been present in the film of Akashi et al., such as being capable of being subsequently aligned, more specifically azimuthally oriented by rubbing, absent evidence to the contrary. Although Akashi et al. do not appear to specifically disclose an epoxy and mesogen in an example, Akashi et al. do disclose that the epoxy is a preferred crosslinking agent (col.6, lines 35-40) present in the instantly claimed range (col.6, lines 40-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the epoxy and the mesogen in mixture because Akashi et al. teach that the epoxy is a preferred crosslinking agent for the mesogen.

Regarding claim 2, Akashi et al. do not teach the necessary inclusion of polyimide (entire document).

Regarding claims 3 and 4, Akashi et al. disclose epoxy that is UV curable and photoinitiator mixed therewith (col.6, lines 26-35).

Regarding claim 54, Akashi et al. disclose wherein the reactive mesogen is a UV curable monoacrylate or diacrylate monomer or oligomer (col.4, line 25-col.5, line 67). Regarding claims 55-57, Akashi et al. disclose wherein the cured polymer film is formed from epoxy and reactive mesogen dissolved in a solvent, more specifically MEK (a ketone) and toluene (Example 1). The claim limitation as recited in claim 55, "which does not damage other layers of the liquid crystal device upon which it is coated" appears to be an intended use limitation and the inherent result therefrom, and has therefore not been treated further on the merits. The intended use of the claimed invention must result in a structural difference between the claimed invention and the

prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). It is not clear how the intended use of the film materially affects the overall claimed film.

Response to Arguments

Regarding applicant's arguments that the liquid crystal composition of Shiota et al. is not capable of being converted from an isotropic film to an anisotropic film after polymerization, it is not clear why this is the case. The materials of Shiota et al. are the same as applicant's, the same mesogen and epoxy as those claimed by applicant, and it is not clear why this film is not capable of being converted from an isotropic film to an anisotropic film after polymerization. It should be noted that the use of the claim language "capable of" does not necessarily mean that the film must undergo conversion, but rather be able to be converted. Applicant has shown no comparative results that would indicate otherwise of the film of Shiota et al.

Regarding applicant's comments concerning Akashi et al. and that the optical properties of Akashi et al. are neither disclosed nor suggested, as pointed out by applicant, Akashi et al. disclose rendering the film clear (col.14, lines 5-15). When this occurs does not appear to matter, as the claim is directed to an article. Regarding applicant's comments that Akashi et al. do not teach or disclose the epoxy and reactive

mesogen mixed prior to polymerization, it appears that Akashi et al. do disclose mixing a crosslinking agent that can be epoxy and a reactive mesogen before polymerization (at col.6, lines 44-49 and as set forth above). The examiner agrees with applicant's arguments concerning adding the solvent of Akashi et al. to Shiota et al., and the subsequent rejection has been withdrawn.

It should be pointed out that from the claim language of claim 1, applicant has not claimed that the epoxy and reactive mesogen produce the claimed polymerized liquid crystals. The claim appears to read on a layer comprising epoxy, reactive mesogen and polymerized liquid crystals.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Keehan whose telephone number is (703) 305-2778. The examiner can normally be reached on Monday-Friday, from 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert A. Dawson can be reached on 308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Christopher Keehan

July 15, 2003

Robert Dawson
Supervisory Patent Examiner
Technology Center 1700